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**FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY**

**IS/WP2-0227
11 AUG 92**

**ADVISORY COMMITTEE ON ADVANCED TELEVISIONS SERVICE
IMPLEMENTATION SUBCOMMITTEE
WORKING PARTY 2 - TRANSITION SCENARIOS
MINUTES OF FORTY-FIRST MEETING 7/21/92**

1. The meeting was called to order by Vice Chairman, Merrill Weiss, at 10:25 A.M. at PBS in Alexandria, VA.
2. The agenda was adopted as issued.
3. The minutes of the 5/19/92 meeting were approved with the following changes:

Page 2, paragraph 2.

- a) number paragraph as a major topic.
- b) 2nd sentence. Modify to read: "He expressed concern that if the process".
- c) delete sentence beginning with "Merrill Weiss responded".

Page 3, item 11.

- a) 4th sentence. Modify to read "..... their efforts to establish encoder development cost."
- b) last sentence. Modify to read "Merrill Weiss was tasked with contacting transmitter and antenna manufacturers to explore their manufacturing capacity."

4. A list of attendees is attached.
5. Review of Action Items.
 - a) Partially complete. Carry as action item.
 - b) Partially complete. Carry as action item.
 - c) No progress. Carry as action item.
 - d) Will be deleted as an action item.
 - e) Complete.

- f) Complete. No change will be made.
- g) Complete.
- h) Complete.
- i) Will be deleted as an action item.

6. Standards Documentation Process.

Craig Tanner presented the draft of a letter to Lynn Claudy, ATSC T3/S1 chairman, concerning the standards documentation process. This letter was a compilation of inputs from Bob Rast, Charles Heuer, Joe Lim, and Dave Folsom. These inputs are shown in attachment IS/WP2-0217. The letter as revised at the meeting will be included with the next IS/WP2 minutes. Craig also distributed ATSC correspondence from Lynn Claudy on the subject of standards documentation. IS/WP2-0219.

The concept of minimum performance requirements on ATV encoder/decoder designs was raised by Jeff Krauss. Considerable discussion followed. It was generally agreed that performance requirements on consumer products should be market driven and not legislated. Craig Tanner will raise the issue of encoder and transmission performance requirements with ATSC.

7. Software Survey.

Merrill Weiss stated that seven phone interviews with software producers have been completed and that six more are pending. Merrill asked the Working Party for suggestions on additional organizations that should be contacted. Craig Tanner suggested that HBO be added to the survey list. Merrill next reviewed results of the completed surveys. In general, responses indicated that most producers expect to have ATV software available one to two years after an FCC decision. Merrill will summarize results of the survey and distribute prior to the next meeting.

8. Local Area Group Update.

Dave Folsom has identified 7 additional local area groups that will be formed in cities where Providence Journal has local affiliates. The chief engineers of these stations will lead the local area group. In addition, the Broadcaster Caucus/MST has suggested that local area groups be formed in Dallas/Ft. Worth and Oklahoma City. It has previously been recommended within IS/WP2 that a local area group be formed in Philadelphia. This brings the total of local area groups to 15. IS/WP2-0220.

9. Distributed Transmission Specialist Group.

Discussions have been held individually among group members on the subject of distributed transmission. Dave Folsom provided a rough analysis of the capital and expense required for implementation and operation of both single and multiple transmission approaches. IS/WP2-0221. After considerable discussion, it was agreed that this issue should be forwarded to SS/WP1 for further study of technical feasibility. Further action within IS/WP2 on this issue will be tabled.

Responses from GI and NHK concerning the distributed transmission approach and additional comments on peak power are shown in attachments IS/WP2-0222 and IS/WP2-0223.

Shown in attachment IS/WP2-0224 is a DOC Communications Research Centre study concerning distributed transmission.

10. Final Report Preparation.

No further work has been done. A conference call will be organized prior to the next meeting to address further development of the final report draft.

11. Review of Proponent Responses.

Merrill Weiss provided a collated summary of all Proponent responses. IS/WP2-0225. This document will be sent to Proponents for review and comments. Merrill Weiss will put together a document summarizing differences among Proponents that may impact implementation. This document will be distributed for comments to IS/WP2 members and Proponents.

12. Professional Equipment Manufacturer Survey.

Merrill Weiss gave an overview of inputs received to date from an informal phone survey of transmitter and antenna manufacturers concerning their capacity to produce ATV equipment. A sampling of results indicates that capacity may not be an issue, but antenna installation may be a problem. Merrill will summarize results when the phone survey is complete.

After a brief discussion, it was decided that best method for proceeding with the professional equipment manufacturers survey would be to identify the most critical equipment in the ATV station block diagram. The broadcaster specialist group organized at the last IS/WP2 meeting will construct a survey based upon evaluation of the ATV station block diagram.

13. Implementation Subcommittee Report.

The IS/WP2 report given at the 6/29/92 Implementation Subcommittee Meeting is shown in attachment IS/WP2-0226.

14. Summary of Action Items.

- a) Complete informal software survey. - Merrill Weiss
- b) Provide information relating to antennas, etc. to Local Area Groups. - Dave Folsom
- c) Review with Field Test Task Force Ed Williams' proposal to use adaptive signal coding to reduce peak to average power requirements. - Jim Kutzner
- d) Review issue of encoder and transmitter minimum performance requirement with ATSC. - Craig Tanner

- e) **Contact SS/W1 concerning study of technical feasibility of distributed transmission. - Craig Tanner/Merrill Weiss**
- f) **Create summary document highlighting Proponent differences that may impact implementation. Distribute to IS/WP2 members and Proponents for comments. - Merrill Weiss.**
- g) **Summarize transmitter and antenna survey results. - Merrill Weiss**

15. **The next meeting is scheduled as follows:**

**Thursday, August 20, 1992
10:00 A.M.
PBS
Media Room, Fifth Floor
1320 Braddock Place
Alexandria, VA**

16. **The meeting was adjourned at 4:20 P.M.**

**FCC ADVISORY COMMITTEE ON ADVANCED TELEVISION SERVICE
WORKING PARTY ON TRANSITION SCENARIOS
(WP2)**

**Tuesday, July 21, 1992
10:00 A.M.
PBS
Media Room, Fifth Floor
1322 Braddock Place
Alexandria, VA**

AGENDA

- 1. Adoption of Agenda.**
- 2. Approval of 6/24/92 Minutes.**
- 3. Review of Action Items.**
- 4. Review Standards Documentation Process Draft.**
- 5. Software Survey.**
- 6. Local Area Group Update.**
- 7. Review Status of Distributed Transmission Specialist Group.**
- 8. Final Report Preparation.**
- 9. Review of Proponent Responses.**
- 10. Professional Equipment Survey.**
- 11. New Business.**
- 12. Conclusions and Actions Items.**
- 13. Next Meeting.**

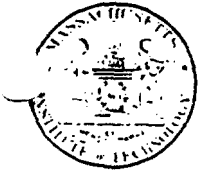
TRANSITION SCENARIOS

WP-2

July 21, 1992

NAME	COMPANY	ADDRESS	PHONE
LARRY COCHRAN	THOMSON (CONSULTANT)	600 N. SHENANDOAH / MAPLE / MD 21201	317-231-4226 317-267-5946
S. Merrill Weiss	Consultant	25 Mulberry Lane - Edison, NJ 08820-2508	908-906-0907 Phone & FAX
John J. ERNANDEZ	PBS	1300 BRADDOCK PL. ALEXANDRIA VA 22314	703-739-5474
DAVID SILLMAN	PBS	" "	703-739-5482
Elizabeth Feary	FCC	2025 M St., N.W. Washington, DC	202-632-6302
JEFF KRAUSS	GI (CONSULTANT)	17 W. JEFFERSON ST #106 ROCKVILLE MD 301-309-3703	
CHARLES HELLER	ZENITH	1000 MILWAUKEE AVE GLENVIEW IL 60025	708-891-8531 W 708-835-2683 H
	ADVANCED BROADCASTING	KIPSCO	613-236-5850
	TELEVISION OF AMERICA	225 ALLEGANY DRIVE CHANDLER AZ 85226	602-926-9241
Craig Tanner	Cablelabs	1050 Walnut St., Suite 500, Boulder, CO 80302	303-439-8500 Tel. 303-439-9189 Fax
KARSTEN AMLE	FCC	2025 M St., N.W. Washington DC (1600W)	202-632-6302
Stan Baron	NBC	30 Rockefeller Plaza, NY, NY 10112	212-664-5219 Fx. 212-664-7557 TL

IS/WP2-0217
21 JUL 92



DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

77 MASSACHUSETTS AVENUE, CAMBRIDGE, MASSACHUSETTS 02139

July 10, 1992

Craig K. Tanner, Chairman
Working Party 6 of the
Planning Subcommittee of the
FCC Advisory Committee
c/o Cable Television Laboratories, Inc.
1050 Walnut Street, Suite 500
Boulder, CO 80302

Dear Craig,

Some preliminary thoughts on the drafting and maintenance of HDTV standards.

Suppose the FCC chooses a particular proponent system as the basis for a standard. In my opinion, the winning system proponent has to take the leadership role and be given a considerable amount of authority in drafting the standard, with other parties playing a support role. If the job is left to a committee that consists of parties with differing interests, it could cause substantial delay in drafting the document.

The winning proponent should be given reasonable incentives to get the draft done as quickly as possible. If the winning proponent is forced to provide without adequate compensation the technical know-how which is very useful for manufacturers, but is not essential to use the standard, there will be considerable resistance from the winning proponent.

In short, the winning system proponent should be given considerable authority to write the standard and should also be given incentives to complete the standard draft as soon as possible.

Sincerely,

A handwritten signature in black ink, appearing to read "Jae S. Lim", with a long horizontal stroke extending to the right.

Jae S. Lim
Professor of Electrical Engineering
Director of Advanced Television
Research Program

GENERAL INSTRUMENT

VideoCipher Division
General Instrument Corporation
6262 Lusk Boulevard
San Diego, CA 92121
619/455-1500
FAX 619/535-2486

July 7, 1992

Craig Tanner
Co-Chairman, IS/WP-2
c/o CableLabs
1050 Walnut Street, Suite 500
Boulder, CO 80302

FAX AND MAIL

Dear Craig:

At the June 24 meeting of IS/WP-2 you requested comments on issues involving the drafting and maintenance of HDTV standards. This letter responds to that request.

The matter is complex and challenging, and has not yet been addressed in depth. It is very useful that some planning be done, to think out potential problems and solutions ahead of time, so that the actual execution is less thorny.

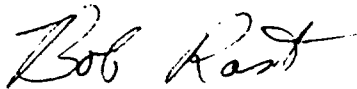
My thoughts:

- One starts with what is the purpose of the various standards? Answers include providing information for use in a regulatory-enforcement sense to ensure compliance, information to assist someone who wishes to practice and comply with the standard, and information for someone understanding who wishes to understand the standard. The needs for different users are not necessarily the same.
- In developing the standards there must be a tradeoff between timeliness and perfection. Standards writing can be quite bureaucratic, and time consuming. But, standards writing should not block/delay implementation of HDTV service. Some compromises are in order.
- Assume that the standards writing should be a multipass effort, with a first, rapid execution followed by later refining edits. That is, get something published relatively quickly, and refine it over time.
- Assume that the winning proponent shares information with manufacturers in parallel with standards writing, and don't allow the standards writing phase to impede such communication.

Craig Tanner
July 7, 1992
Page 2

- Implement a small team approach to generating the standards, with the proponent plus a few "helpers" designated to produce a first draft for review by a larger group.
- Assume that the proponent and manufacturers are economically motivated to cooperate and are of good will, and will cooperate. Play a referee role, realizing that there is likely to be plenty of feedback, and at least some griping.
- It is not yet clear exactly what needs to be in the various standards. It appears that the FCC would like to be somewhat general, referring to another document, e.g., an ATSC standard, for details. How to divide between the two is an issue to be resolved.
- How to describe that which is being standardized is an issue. It will be inadequate to only describe the transmitted signal. There will also probably need to be discussion of the algorithm used to generate the data stream, or an algorithm necessary to receive it.
- Algorithmically, does there need to be a minimum performance specification on either the encoder or decoder side in order to comply? Are there then optional features which must be described in the standards?
- Should the standard(s) leave the door open to extensions, allowing them to occur without further modification of the standard(s)?
- Recognize that the technology, the system and the standards will evolve over time, and that there must be a review and maintenance mechanism which can support that evolution. That seems to be an issue with respect to standards which would be written by the ATSC, since the ATSC is assumed to go out of existence within a year or two. Perhaps any standards written by the ATSC need to be issued by one or more of its sponsoring organizations, with maintenance over time assigned to the issuing organization.

Sincerely,



Robert M. Rast
Vice President, HDTV Business Development

cc: Jerry Heller
Jeff Krauss
Jae Lim

Woo Paik
Quincy Rodgers



ZENITH ELECTRONICS CORPORATION □ 1000 MILWAUKEE AVENUE □ GLENVIEW, ILLINOIS 60025-2493

VIA FAX

WAYNE C. LUPLOW
DIVISION VICE PRESIDENT
RESEARCH AND DEVELOPMENT
ADVANCED TELEVISION SYSTEMS
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July 8, 1992

Mr. Craig Tanner
CableLabs
1050 Walnut Street
Suite 500
Boulder, CO 80302

Dear Craig,

Congratulations on your new role with IS/WP-2. As always, we at Zenith (and AT&T) will do our best to diligently support the work of the Advisory Committee and all its supporting structure.

Charlie Heuer, based on discussions in Washington last week, jotted down thoughts on the "Standards Setting Process" which may be useful to you.


W. Luplow

WL/cgq/encl.

cc: C. Heuer

OBSERVATIONS ON THE STANDARDS PROCESS

The Special Panel will specify an HDTV system to be recommended to the Advisory Committee. One presumes that system will in turn be recommended to the FCC, approved and implemented in the appropriate variety of standards and specifications.

It is likely that the Special Panel output will include changes or additions mandated as part of the selection of a proponent's system. These could be

- o agreed changes suggested or required by the proponent;
- o agreed changes proposed by the Special Panel;
- o desired changes which cannot be resolved in the one-week lifetime of the Special Panel.

To the extent any changes suggest that further testing may be required, one can suggest that SS/WP-1 should make that technical determination, working with SS/WP-2, the Field Test Task Force, and the proponent.

Given a system recommendation by the Special Panel and the Advisory Committee, documentation of the system should be expedited. The convenor of standards activity should assure that the output of this activity reflects the system parameters and performance expected and agreed by the Special Panel and the chosen proponent.

It will be helpful in administering this process to distinguish between the system to be standardized and the Standards or specifications (at any level) which implement the system:

- o The system to be standardized is that chosen by the Special Panel and subject of proposed rulemaking by the FCC and of which the proponent is the principal interpreter.
- o The Broadcast Standards (and any Technical Bulletins) which implement the system must reflect the format and content required by the FCC.
- o Peripheral standards must meet the industry purposes for which they are drafted.

The technical content is primarily the domain of the proponent - the structure and language should reflect the inputs of other interested parties.

For example, the system chosen will have an accepted capability in features and performance, in compatibility with other media and applications, in capability for auxiliary services, in future flexibility, etc. The standards convenor should ensure these capabilities are retained, should ensure that the standards process does not attempt to change or inadvertently change or augment the system, and should ensure that the Standards language and structure do not unduly restrict present or future implementation within the agreed system concept.

Charles Heuer
Zenith Electronics Corp.
July 8, 1992



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CHARLOTTE, NC 28217-1901
(704) 329-3636

Craig Tanner
CableLabs
1050 Walnut St.
Suite 500
Boulder Co. 80302

July 7, 1992

Dear Craig,

Thank you for giving me the opportunity to pass on some impressions I gained in a committee-based standards setting process in which I participated that might be of value in the upcoming ADTV standardization process.

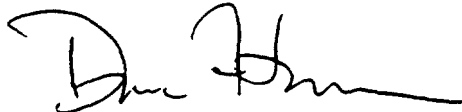
- **The scope of the work to be done by the committee must be spelled out precisely prior to the process.** There will be a tendency by the everyone involved in this standardization process to pass on "improvements" to the overall system that must be described in the standard. Although these changes might appear to have merit they often lead to endless theoretical discussions or create delay prone testing. Also, extensive changes could also lead to litigation from the losing proponents because it might be viewed as subverting the original criteria of the selection process.
- **Strong near-full-time leadership in this effort is a must.** Also, co-chairmanship or shared committee leadership will probably lead to conflicting missions, priorities and possible disagreement. Speed and a single-minded sense of mission should be the goal.
- **Keep the committee small.** There will be an overwhelming tendency to include every special interest and field of expertise on this committee to insure that some vital area is not forgotten. Although this goal is nice in theory, it weighs down the process and only hinders its progress.
- **Make this standards committee a permanent organization.** This standard must adapt in the future to improvements and breakthroughs in technology. Built into the ADTV system concept is extensibility that must be exploited as the need and capability arises.

- **Set a timetable and keep to it.** Unfortunately, the time that it takes to complete any accomplishment is always affected by the time you are willing to spend in pursuit of that accomplishment. Fuzzy timetables coupled with a willingness to delay, will always lead to delay.

Although the principals stated above would seem to be self evident, rarely are they incorporated into a this type of standards setting organization. Political and economic self interest tend to prevail in these committees. The normally unfounded fear of offending or not including an individual's or corporation's ideas and comments in this type of process has a tendency to deflect the mission of work that needs to be accomplished. Our inbred sense of fair play sometimes stands in the way of progress. Unfortunately in this type of process, committee work too often leads to compromise and not consensus. This committee should, after all, describe technically a system that already exists and should not concern themselves in what the system could, should or might be if only...

I hope my comments are useful.

Sincerely,



Dave Folsom
Director of Engineering
WCNC-TV
Providence Journal Broadcasting

cc: Merrill Weiss

21 JUL 92



Science and Technology

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FAX: (202) 775-3520

MEMORANDUM

To: ATSC T3 Technology Group
From: Lynn Claudy, Chairman, T3/S1 Specialist Group on Macro Systems Approach
Subject: HDTV Standard Documentation for FCC Rules
Date: June 25, 1992

The ATSC Executive Committee has been examining the proper role of ATSC in the various standards efforts that will follow selection of an HDTV system by the FCC. It has been suggested that ATSC should document the terrestrial transmission standard such that it can be included in the Commission's final Report and Order on Advanced Television Service. Views on this subject were submitted to the FCC on June 5 and were distributed to ATSC members.

The task of documenting a digital HDTV standard includes issues that do not exist with analog standards such as NTSC television. Similar to NTSC, the FCC will of course require full documentation in the Rules on the RF characteristics of the system -- characteristics that would affect service and interference such as occupied bandwidth, spectral profile and transmission power requirements and limits. Unlike NTSC, receiver or receive antenna characteristics could be included if stringent standards are necessary to insure a viable HDTV service. Also unlike NTSC, source coding techniques/algorithms may need to be documented by the FCC to insure compatibility among HDTV receivers in the marketplace. Some flexibility in source decoding may be accommodated if a standard header/descriptor structure is included and this could also potentially be part of the Commission's Rules. Special services such as multiple audio channels, closed captioning and other data services may need to be addressed as well.

T3/S1 has been asked by the Executive Committee to begin the process of outlining the content of the HDTV standard, specifically documentation that will be needed for inclusion in the FCC Rules, as referenced in the ATSC's June 5 submission to the FCC. A meeting of T3/S1 will be scheduled in the near future to address these issues.



Science and Technology

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MEMORANDUM

To: ATSC T3/S1 (Specialist Group on Macro Systems Approach) members and other interested parties
From: Lynn Claudy, T3/S1 Chairman
Subject: Meeting Notice
Date: July 10, 1992

At the June 25 meeting of the ATSC T3 Technology Group on Distribution, the attached memo was distributed and it was agreed to set up a conference call of T3/S1 to discuss the issue of documenting the HDTV standard for inclusion in the FCC Rules.

A conference call of T3/S1 will be held on Friday, July 24, 1992, at 2:00 p.m. If you or someone in your organization wishes to participate, please contact me (202-429-5340 tel. 202-775-4981 fax) or Pavanne Veltman (tel. 202-429-5346) in our office by July 22 to confirm your attendance and telephone number.

A draft agenda for the discussion is as follows:

1. Introduction and role of ATSC
2. Level of technical disclosure from proponents
3. Appropriate content for FCC standard
 - a. RF spectrum issues
 - b. Source coding
 - c. Special services
 - d. Receiving equipment
4. Other business
5. Next Meeting

Please feel free to call if you have any questions.

**Local Area Group Cities for of the FCC Advisory Committee for Advanced
Television Service (ACATS), implementation Subcommittee,
Working Party 2 on Transition Scenarios.**

as of 8/11/92

Albuquerque
Boise
Boston
Chicago
Dallas-Fort Worth
Honolulu
Los Angeles
New York
Oklahoma City
Philadelphia
Portland Or.
San Francisco
Seattle
Spokane
Tucson

21 JUL 92

Capital and Expense Budget for HDTV Single Transmitter vs. Multiple Transmitters

Capital Expense

	Single Transmitter (existing tower)			Single Transmitter (new tower)			Multiple Transmitter (rent space)			Multiple Transmitter (build towers)		
	Qty.	Each	Total	Qty.	Each	Total	Qty.	Each		Qty.	Each	Cost
Transmitter(s)	1	\$500,000.00	\$500,000.00	1	\$500,000.00	\$500,000.00	8	\$60,000.00	\$480,000.00	8	\$60,000.00	\$480,000.00
Tower(s)		\$0.00	\$0.00	1	\$800,000.00	\$800,000.00		\$0.00	\$0.00	8	\$30,000.00	\$240,000.00
Transmission Line	1500	\$100.00	\$150,000.00	1500	\$100.00	\$150,000.00	1600	\$10.00	\$16,000.00	1600	\$10.00	\$16,000.00
Antenna(s)	1	\$250,000.00	\$250,000.00	1	\$250,000.00	\$250,000.00	8	\$20,000.00	\$160,000.00	8	\$20,000.00	\$160,000.00
Land		\$0.00	\$0.00	25	\$10,000.00	\$250,000.00	8	\$6,000.00	\$48,000.00	8	\$6,000.00	\$48,000.00
Building		\$0.00	\$0.00	1	\$30,000.00	\$30,000.00	8	\$10,000.00	\$80,000.00	8	\$10,000.00	\$80,000.00
Terminal Equipment		\$40,000.00	\$40,000.00		\$40,000.00	\$40,000.00	8	\$20,000.00	\$160,000.00	8	\$20,000.00	\$160,000.00
Inter-city Relay	1	\$125,000.00	\$125,000.00	1	\$125,000.00	\$125,000.00	0	\$0.00	\$0.00	0	\$0.00	\$0.00
Fiber Interconnect		\$0.00	\$0.00		\$0.00	\$0.00	8	\$15,000.00	\$120,000.00	8	\$15,000.00	\$120,000.00
Digital Interface and Delay		\$0.00	\$0.00		\$0.00	\$0.00	8	\$10,000.00	\$80,000.00	8	\$10,000.00	\$80,000.00
Test Equipment		\$100,000.00	\$100,000.00		\$100,000.00	\$100,000.00		\$100,000.00	\$100,000.00		\$100,000.00	\$100,000.00
Remote Control and Monitoring		\$18,000.00	\$18,000.00		\$18,000.00	\$18,000.00	8	\$6,000.00	\$48,000.00	8	\$6,000.00	\$48,000.00
Total			\$1,183,000.00			\$2,263,000.00			\$1,292,000.00			\$1,532,000.00

Monthly Operating Expense

Tower Rental		\$0.00	\$0.00		\$0.00	\$0.00	8	\$1,500.00	\$12,000.00		\$0.00	\$0.00
Leased Fiber		\$0.00	\$0.00		\$0.00	\$0.00	240	\$350.00	\$84,000.00	240	\$350.00	\$84,000.00
Power	180000	\$0.05	\$9,000.00	180000	\$0.05	\$9,000.00	48000	\$0.05	\$2,400.00	48000	\$0.05	\$2,400.00
Additional Site Maintenance		\$500.00	\$500.00	1	\$2,000.00	\$2,000.00		\$0.00	\$0.00	8	\$250.00	\$2,000.00
Maintenance Expense (Parts)		\$830.00	\$830.00		\$830.00	\$830.00	8	\$200.00	\$1,600.00	8	\$200.00	\$1,600.00
Maintenance Expense (Personnel)		\$0.00	\$0.00	1	\$2,920.00	\$2,920.00	1	\$2,929.00	\$2,929.00	1	\$2,920.00	\$2,920.00
Total Monthly Expense			\$10,330.00			\$14,750.00			\$102,929.00			\$92,920.00
Total Annualized Expense			\$123,960.00			\$177,000.00			\$1,235,148.00			\$1,115,040.00

Assumptions made within Capital and Expense Budget for HDTV Single Transmitter vs. Multiple Transmitter

Single Transmitter Scenario-

Transmitter - 30KW to 40KW uhf, no combining, harmonic filter only.
 Tower - 1500 ft, 8ft face, no elevator, wide spread guying
 Transmission Line - 1500 ft. @ \$100/ft installed
 Antenna - Omni UHF traveling wave type 50 KW max at flange
 Land - 25 Acres (min for 1500ft tower) @ \$10,000 /acre
 Building - Concrete block building/ air cond with min upgrades
 Terminal Equipment - Internal digital distribution and transcoding
 Intercity Relay - 6 Ghz fully redundant (hot standby 1W) with 2 -10ft dishes
 capable of QPSK
 Test Equipment - Spectrum analyzer, HDTV B.E.R. set, Digital scope,
 HDTV Test Gen.
 Remote Control and Monitoring - Moseley Style 32 telemetry, control, status

Multiple Transmitter Scenario-

Transmitters - 100W - 250W uhf, per loc, no combining, harmonic filter only.
 Tower - 150 ft, self supporting tower (similar to cellular radio)
 Transmission Line - 200 ft. @ \$10/ft installed per loc.
 Antenna - Omni UHF whip style per loc, 1 KW max at flange
 Land - <1 Acres (min for 150ft tower) @ \$6,000 per loc.
 Building - Prefab Concrete / air cond with min upgrades per loc.
 Terminal Equipment - Internal digital distribution and transcoding
 Fiber Interconnect - Multimode fiber digital interface
 Digital Interface and Delay - Fiber digital transmission mode conversion
 and location delay per loc.
 Test equipment - As above shared with all locations
 Remote Control and Monitoring - Multisite Moseley style 16 tele, cont, stat
 per loc.
 Test Equipment - Spectrum analyzer, HDTV B.E.R. set, Digital scope,
 HDTV Test Generator
 Remote Control and Monitoring - Moseley Style 32 telemetry, control, status

Expense Assumptions-

Tower Rental - \$1500 per month per loc. for 16 ft whip style antenna.
 Leased Fiber - "dark fiber" \$350/mile 30 miles assumed via hub
 Power - 180kW/hr @ \$.05 for high power xmr- 48 kW/hr @ \$.05 for mult.
 Additional Site Maint - Incremental increases due to additional transmitting
 antenna on tower or additional tower site to manage
 (tower maint, lawn mowing etc.)
 Maintenance (Parts) - Tubes etc. based on experience
 Maintenance (Personnel) - With transmitter on existing tower no additional
 personnel necess., With additional sites one
 additional person rec. @ \$35,000/ann.

1570572-0222
21 JUL 92

**GENERAL
INSTRUMENT**

**VIDEOCIPHER DIVISION
6262 Lusk Blvd.
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FAX TRANSMITTAL FORM

DATE: 18 June 1992

TO: Merrill Weiss
Acting Chairman, IS/WP-2

FAX #: (908) 906-0907

SENDER: Woo H. Paik

SUBJ: Answers on Peak Power and Cellular Operation

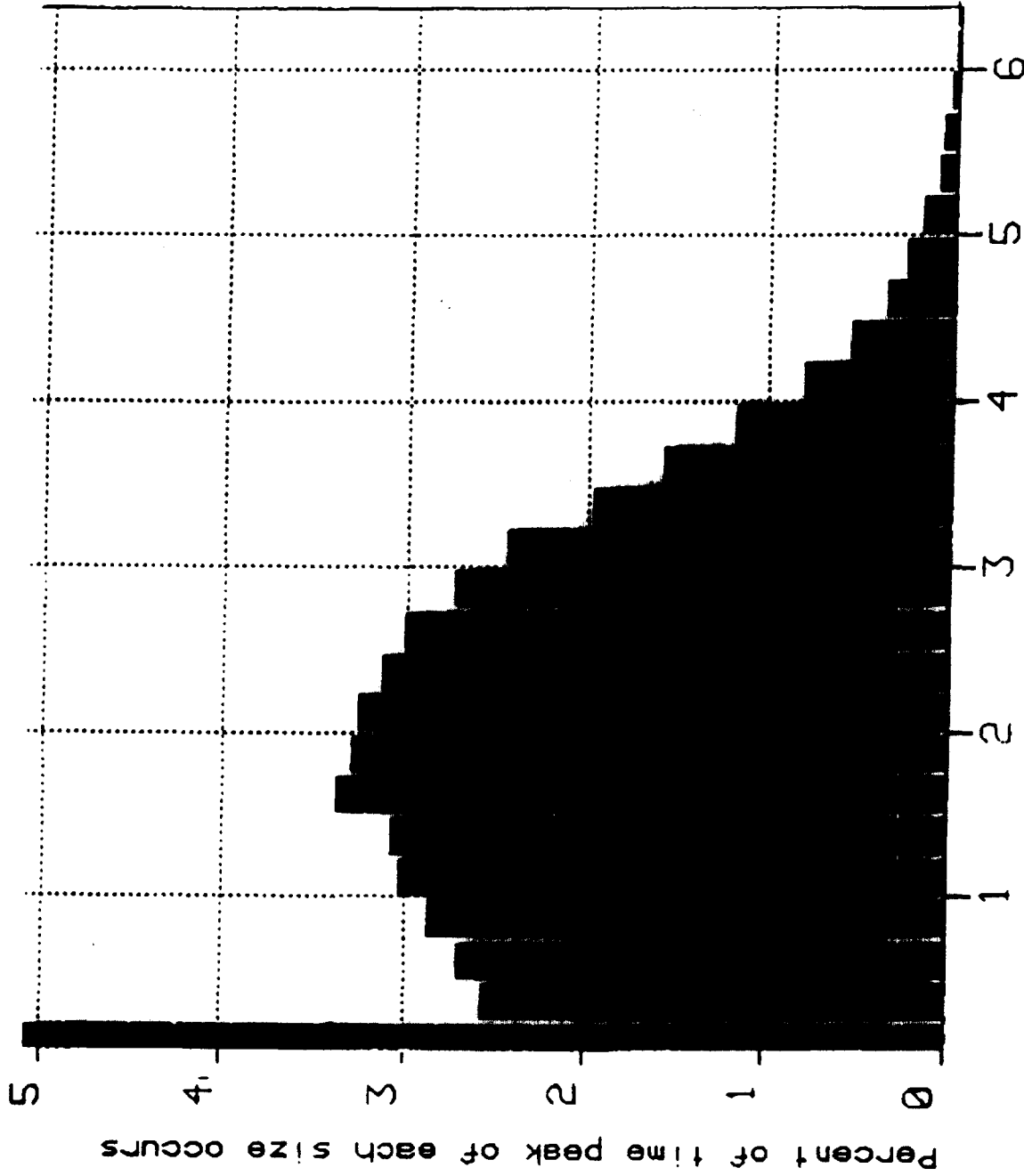
TOTAL NUMBER OF PAGES SENT (INCLUDING THIS PAGE): 2

Attached you will find our response to additional questions on Peak Power and Cellular Operation.

cc: J. Heller
R. Rast
J. Lim

Broadcast

8. The attached histogram shows the percentage of time peak occurs as a function of the amplitude of the peak above average for the DigiCipher™ HDTV signal. The histogram has been generated by using 0.25 dB range for each peak. The absolute peak has been measured at 7 dB above the average.
9. The effect of clipping the peaks of the DigiCipher™ HDTV signal will show as increased TOV measured in carrier-to-noise (C/N) ratio. Preliminary tests showed little effect in TOV when clipping occurred at 5 dB above average (i.e. 2 dB below peak). Clipping in general allows us to transmit higher average power for a given amplifier, but it has to be compared against any increase in TOV. For example, if clipping at 3 dB below the peak level causes 1 dB increase in TOV, then there is a net gain of 2 dB. On the other hand, if clipping at 3 dB below the peak level causes 4 dB increase in TOV, then there is a net loss of 1 dB. It is not recommended to clip the peak below the level where the incremental net gain is zero.
10. The DigiCipher™ HDTV system has been designed to operate properly with multiple signals carrying identical modulation arriving at the receiver, as would be the case with cellular operation or on-channel boosters. The built-in adaptive equalizer can work with multiple signals with frequency offset up to 5 Hz or more. The minimum difference in signal levels depends on the offset in time, and the DigiCipher™ HDTV system requires 6 dB for up to 4 μ sec and 12 dB for up to 24 μ sec.



Peak Power in dB Above Avg

NHK New York

VOICE 212-489-9550

FAX 212-489-9559

TO : Mr. S. Merrill Weiss

FROM : Keiichi Kubota

DATE : 6/22

PAGES TO FOLLOW : 2

MESSAGE :

Merrill,

Here is our answer to your
questions.

Keiichi

IF YOU HAVE ANY QUESTIONS REGARDING THIS FAX
PLEASE CALL AT: (212)489-9550

N H K
JAPAN BROADCASTING CORPORATION

GENERAL BUREAU FOR AMERICA
ROOM 1430
1 ROCKEFELLER PLAZA
NEW YORK, N. Y. 10020

(212) 489-9550

June 22, 1992

Mr. S. Merrill Weiss
Chairman
IS/WP2 of FCC Advisory Committee on Advanced Television Service
25 Mulberry Lane
Edison, NJ 08820-2908

Dear Merrill:

Here is NHK's answer to your follow-up questions. Since these questions are intended for digital transmission systems, our answer is relatively simple. If you have any questions, please call me at (212) 489-9550.

Sincerely,



Keiichi Kubota
Senior Scientist

June 22, 1992
NHK

Answers to Follow-up Questions

Broadcast

8. Do you have information on the percentage of time peak powers of various levels above the average power occur with your system? If yes, please supply such information. A histogram showing the frequency of peaks of increasing power levels is the preferred form of presentation.

This question is not applicable to Narrow-MUSE, because Narrow-MUSE employs the analog amplitude modulation scheme. The percentage of time peak powers of various levels above the average power depends on the picture contents.

9. Please supply information on what BER results from clipping the peaks of your signal at various levels above the average power of your system. Does the increase in BER directly correlate with the appearance of errors in the viewed picture? Is there some other measure than BER by which the effects of clipping should be evaluated? Please comment on the trade-offs resulting from the process of clipping peaks.

This question is not applicable to Narrow-MUSE, because Narrow-MUSE employs the analog amplitude modulation scheme. The peak power cannot be clipped because to clip the peaks directly causes the waveform distortion of the picture.

10. Is your system capable of dealing with multiple signals carrying identical modulation arriving at the receiver, as would be the case with cellular operation or on-channel boosters? How close in frequency must the multiple signals be for the system to work properly? Is there any threshold in the difference in signal levels required to make the system work properly under such circumstances, and what is that threshold?

Narrow-MUSE works properly under the condition such as cellular operation or on-channel booster if the ghost cancelling algorithm in the receiver is modified so that the convergence time is less than 5 seconds (currently 30 seconds). However, these kinds of operations do not have advantage for Narrow-MUSE broadcasting, because Narrow-MUSE employs the analog transmission scheme, and hence it shows a graceful degradation.